

Reply to office action of April 28, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented) A coating to be applied to an electrically conductive material, said coating being non-electroplated, consisting of more than 1.0 wt% to about 20 wt% silver and the balance tin, having a melting point greater than 225°C, and a hardness in the range of from 0.32 to 0.41 GPa.

2. (original) A coating according to claim 1, wherein said silver content in said coating is in the range of from 2.0 wt% to 15 wt%.

3. (original) A coating according to claim 1, wherein said silver content in said coating is in the range of from 3.0 wt% to 10 wt%.

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4. (original) A coating according to claim 1, wherein said coating has a thickness in the range of from 0.00001" to 0.001".

5. (cancelled)

6. (cancelled)

7. (previously presented) A coating material consisting of more than 1.0 wt% to 20 wt% silver, at least one addition selected from the group consisting of bismuth, silicon, copper, magnesium, iron, manganese, zinc, and antimony in an amount effective to increase coating hardness up to 5.0 wt%, and the balance tin, said coating material being non-electroplated and having a hardness in the range of from 0.32 GPa to 0.41 GPa.

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8. (original) A coating material according to claim 7, wherein said silver content of said coating material is in the range of from 2.0 wt% to 15 wt%.

9. (original) A coating material according to claim 7, wherein said silver content of said coating material is in the range of from 3.0 wt% to 10 wt%.

10. (previously presented) A coating material according to claim 7, wherein said at least one addition is present in an amount which does not cause the formation of deleterious oxides.

11. (previously presented) A coating material according to claim 10, wherein said at least one addition is present in an amount ranging from 0.1 wt% to said amount which does not cause the formation of deleterious oxides.

12. (original) A coating material according to claim 7, wherein said coating has a thickness in the range of from 0.00001" to 0.001".

13. (cancelled)

14. (original) A coating material according to claim 7, wherein said coating material is a non-electroplated material and has a melting point greater than 225°C.

15. (previously presented) A composite comprising a substrate material and a non-electroplated layer of coating material on at least a portion of said substrate material and said coating material consisting of more than 1.0 wt% to about 20 wt% silver, copper in a range from 0.1 wt% to 5.0 wt%, and the balance tin and having a hardness in the range of from 0.32 to 0.41 GPa.

16. (original) A composite according to claim 15, wherein said silver content of said coating material is in the range of from 2.0 wt% to 15 wt%.

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17. (original) A composite according to claim 15, wherein said silver content of said coating material is in the range of from 3.0 wt% to 10 wt%.

18. (previously presented) A composite according to claim 15, wherein said substrate material comprises a non-ferrous based material.

19. (original) A composite according to claim 15, wherein said substrate material comprises a copper-tellurium alloy.

20. (original) A composite according to claim 15, wherein said coating material directly contacts a surface of said substrate material.

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CONT* 21. (original) A composite according to claim 15, wherein said coating material has a melting point greater than 225°C.

22. (cancelled)

23. (original) A composite according to claim 15, wherein said coating material has a thickness in the range of from 0.00001" to about 0.001".

24. (original) A composite according to claim 15, wherein said composite comprises an electrical connector.

25. (currently amended) A composite comprising a substrate material and a ~~non-electroplated~~ non-electroplated layer of coating material over at least a portion of said substrate material, and said coating material consisting of more than 1.0 wt% to about 20 wt% silver, at least one addition selected from the group consisting of bismuth, silicon, copper, magnesium, iron, manganese, zinc, and antimony in an amount effective to increase coating hardness up to at least 5.0 wt%, and the balance tin, and having a hardness in the range of from 0.32 GPa to 0.41 GPa.

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26. (original) A composite according to claim 25, wherein said silver is present in an amount from 2.0 wt% to 15 wt%.

27. (original) A composite according to claim 25, wherein said silver is present in an amount from 3.0 wt% to 15 wt%.

28. (previously presented) A composite according to claim 25, wherein said substrate material is formed from a non-ferrous based material.

29. (original) A composite according to claim 25, wherein said substrate material is formed from a copper-tellurium alloy.

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30. (cancelled)

31. (original) A composite according to claim 25, wherein said coating material has a thickness in the range of from 0.00001" to 0.001".

32. (cancelled)

33. (previously presented) A composite according to claim 25, wherein said at least one addition is present in an amount from 0.1 wt% up to an amount which does not create deleterious oxides.

34. (original) A composite according to claim 25, wherein said coating material directly contacts a surface of said substrate material.

35. (original) A composite according to claim 25, wherein said coating material has a melting point greater than 225°C.

36. (cancelled)

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37. (currently amended) A process according to claim 39, wherein said preparing step comprises preparing a bath containing consisting of from 2.0 wt% silver and the balance tin.

38. (currently amended) A process according to claim 39, wherein said preparing step comprises preparing a bath containing consisting of from 3.0 wt% to 10 wt% silver and the balance tin.

39. (currently amended) A process for coating a substrate material comprising the steps of:

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providing a substrate material to be coated;

preparing a bath consisting of more than 1.0 wt% to about 20 wt% silver and the balance tin;

immersing said substrate material in said bath to form a non-electroplated coating layer on said substrate material, which coating layer consists of more than 1.0 wt% to about 20 wt% silver and the balance tin and which coating has a hardness in the range of 0.32 GPa to 0.41 GPa; and

maintaining said bath a temperature greater than 500°F during said immersing step.

40. (original) A process according to claim 39, wherein said maintaining step comprises maintaining said bath at a temperature of from 500°F to 900°F during said immersing step.

41. (previously presented) A process according to claim 39, wherein said immersing step comprises continuously passing said substrate material through said bath.

42. (previously presented) A process according to claim 39, wherein said immersing step comprises discontinuously passing said substrate material through said bath.

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43. (previously presented) A process according to claim 39, wherein said immersing step comprises immersing a batch of said substrate material into said bath and maintaining said batch within said bath for a time period sufficient to form said coating.

44. (previously presented) A process according to claim 39, further comprising keeping said substrate material resident in said bath for a time period in the range of 0.2 seconds to 10 seconds.

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45. (previously presented) A process according to claim 39, further comprising applying a lubricant to surfaces of said substrate material after said immersing step.

46. (currently amended) A process for forming a non-electroplated coating on a substrate material comprising the steps of:

preparing a bath consisting of more than 1.0 wt% to about 20 wt% silver, at least one constituent selected from the group consisting of bismuth, silicon, copper, magnesium, iron, nickel, manganese, zinc, and antimony in an amount sufficient to increase coating hardness and up to 5.0 wt%, and the balance tin; and

maintaining said bath at a temperature of at least 500°F; and

immersing said substrate material in said bath for a resident time period of from 0.2 to 10 seconds.

47. (original) A process according to claim 46, wherein said immersing step comprises continuously passing said substrate material through said bath.

48. (original) A process according to claim 46, wherein said immersing step comprises discontinuously passing said substrate material through said bath.

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49. (original) A process according to claim 46, wherein said immersing step comprises introducing a batch of said substrate material into said bath.

50. (original) A process according to claim 46, wherein said maintaining step comprises maintaining said bath at a temperature in the range of 500°F to 900°F.

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51. (previously presented) A composite material comprising a continuous length of strip material formed from a non-ferrous material and a non-electroplated coating on surfaces of said strip material to prevent surface oxidation of said strip material, said coating consisting of from 2.0 wt % to 20 wt% silver and the balance tin and having a hardness in the range of from 0.32 to 0.41 GPa.
